

Work Order ID 55406

Page 1

January 18, 2010 10:33:22 AM

Item ID: D212-664-107

Accept



Setup

Start



Revision ID:

Item Name: Crosstube Low Standard Fwd

Stop



Start Date: 1/18/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 1/28/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: *MP*

Date: 10-1-18 Tooling:

Date:

Run

Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
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D212-664-147

Rev B

100



DOCUMENT CONTROL

DC

Document Control

Memo

0.00

Photocopy bluefile and create labels as per PPP D212-664-107 CHG001

10/02/17
MP for BG 10/02/17

110



Packaging

Packaging

Memo

0.00

0.00

✓ MB 10-01-21

120



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D212-664-107 using CNC bender program 212-107

(X) MB 10-01-21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00

=> S1010121

60



QC

Memo

0.00

Quality Control

140

Crosstubes

0.00

Crosstubes

Memo

0.00

Crosstubes

1-Cut tube as per inspection dwg. ***ensure saw is square***



2-Drill pilot holes in tube as per Dwg D212-664-147

3-Drill Rivet holes as per Dwg D212-664-147 using DT8972.

4-Ream hole to finish size in tube as per Dwg D212-664-147

5-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-147

10-1-26

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____

Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____

Date: _____

Stop

Sequence ID/
Work Center ID

150

Operation
Description

Crosstubes Chemical Conversion

Set Up/
Run Hours

0.00

Draw
Number

Rev.

Plan
CodeAccept
QtyReject
QtyReject-
NumberInsp.
Stamp

HandFXtube

Hand Finishing Crosstubes

10-01-28

160



QC3- Inspect Part Finish

0.00

QC

Quality Control

170



QC5- Inspect part completeness to step on W/O

0.00

Quality Control

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180



Outsource process - NDT per QSI038 4.1

0.00

1/18/2010

Outsource2

Memo

0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 038Or
Issue P/O: 11290 LPI as per ASTM 1417
Level 2 Attach copy of NDT results to work order

190



Packaging

0.00

1/18/2010 C

Packaging

Memo

0.00

Packaging

Ensure copy of NDT results attached to work order.

200



QC5- Inspect part completeness to step on W/O

0.00

QC

Memo

0.00

Quality Control

Inspect for damage & ensure results are as per Dwg D212-664-107

1/18/2010 02 02 01

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Customer:

Reference:

Approvals: Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start



QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

Sequence ID/
Work Center ID

210

Operation
Description

Crosstubes

Set Up/
Run Hours

0.00

Draw
Number

Rev.

Draw
Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

Crosstubes

Memo

0.00

Crosstubes

1-Rivet Cuffs as per Dwg D212-664-147. with Sika flex in Between tube & Cuff
A/R SIKAFLEX -241/-291 BATCH: 112345

M

10

02

02 01

220



SprayPaint

0.00

M

10

02

10 0

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: 8:00Finish Time: 8:30

PAINT:

Start Time: 2:30Finish Time: 3:30

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Accept



Setup Start



Stop



Required Date: 1/28/2010 Req'd Qty: 1.00



Cust Item ID:



Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center ID

230



QC

Quality Control

Operation
Description

QC14- Inspect Spray Paint

Set Up/
Run Hours

0.00

Draw
Number

Rev.

Plan
CodeAccept
QtyReject
QtyReject
NumberInspec.
Stamp

240



Crosstubes

Crosstubes

0.00

Crosstubes

Memo

0.00

1- Assemble as per Dwg D212-664-147

2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

3- Instal support with magnobond 6398 per dwg D212-664-147, cure for 12hrs before packaging.

Time & date of application: 11.00

Batch: 112417

EXP. DATE 01/2011

Torque: in/l 10/02/17 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Start Date: 1/18/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 1/28/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center ID

250



QC

Quality Control

Operation
Description

QC5- Inspect part completeness to step on W/O

Set Up/
Run Hours

0.00

S 1/18/17

Draw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

260



QC

Quality Control

QC4- 100% Inspect kits for completeness

0.00

S 1/18/17

0.00

(4)

270



Packaging

Packaging

0.00

0.00

P010/2/18/17

Packaging

Memo

Identify and pack for shipping as per PPP D212-664-107

MVR-A

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Cust Item ID:

Required Date: 1/28/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center ID

280



QC

Quality Control

Operation
Description

QC21- Final Inspection - Work Order Release

Set Up/
Run Hours

0.00

Draw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

10/02/18 AJ

Memo

0.00

ME

10-2-18

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Picklist Print

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Page 1

Work Order ID: 55406



Parent Item: D212-664-107



Parent Item Name: Crosstube Low Standard Fwd

Start Date: 1/18/2010

Required Date: 1/28/2010

Comments: IPP Rev:A New Issue 07.09.12 EC verified by: JLM
IPP Rev:B ECN 1100 08-01-11 DD verified by: EC
IPP Rev:C Ecn 1121 08-02-25 DD Verified by:ec

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ D212-664-107TRN	Replacement	Mfg/ Manufactured	Bin No	Primary	Last	Route 140	Unit of Each	Qty on 5.0000	Remaining 1.0000	Qty	Date	Status

Crosstube Turning Detail

Warehouse Loc Qty Loc Code

Location

Main Warehouse

LG

5

50700

1

50705

1

50706

1

53419

1

53420

1

D3659-1

Manufactured

No

220

Each

16.0000 2.0000

✓ MB 10-OF-17

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST

15

50691

15

Main Warehouse

ST477

1

52598

1

CUFF

DP/1-26

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

Picklist Print

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Start Date: 1/18/2010

Required Date: 1/28/2010

Comments: IPP Rev:A New Issue 07.09.12 EC verified by: JLM
 IPP Rev:B ECN 1100 08-01-11 DD verified by: EC
 IPP Rev:C Ecn 1121 08-02-25 DD Verified by:ec

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/ Purchased	Bin	Primary	Last	Route	Unit of Each	Qty on 1,706.000	Remaining 44.0000	Qty	Date	Status
CR3212-4-06			No			240						

CHERRY RIVET

Warehouse

Location

Main Warehouse

ST	1706	
107534	6	
112492	200	
112612	500	
112724	200	
112794	800	

W 10/02/02

D3595-063-450

Manufactured No

240 Each 160.1266 4.0000



RUBBER CUSHION

Warehouse

Location

Main Warehouse

LG	55.15767369	
52447	55.1576737	

W 10/02/16

Main Warehouse

ST	104.9689	
38959	2	
43210	2.59	
46465	0.3789	
52447	100	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Start Date: 1/18/2010

Required Date: 1/28/2010

Comments: IPP Rev:A New Issue 07.09.12 EC verified by: JLM
IPP Rev:B ECN 1100 08-01-11 DD verified by: EC
IPP Rev:C Ecn 1121 08-02-25 DD Verified by:ec

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ MS21920-25	Replacement	Mfg/ Purchased	Bin	Primary No	Last	Route 240	Unit of Each	Qty on 173.0000	Remaining 4.0000	Qty 	Date	Status
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Clamp(per MIL-DTL-8783C)

<u>Warehouse</u> <u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
Main Warehouse		
ST	173	
107456	2	
108111	3	
108975	17	
109181	42	
109644	10	
<u>111282</u>	4	
111429	1	
112495	1	
112919	18	
113281	25	
113282	50	

W 10/02/16

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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Comments: IPP Rev:A New Issue 07.09.12 EC verified by: JLM
IPP Rev:B ECN 1100 08-01-11 DD verified by: EC
IPP Rev:C Ecn 1121 08-02-25 DD Verified by:ec

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/ Manufactured	Bin	Primary No	Last	Route	Unit of Each	Qty on 59.0000	Remaining 2.0000	Qty	Date	Status
D2893-1						240						



2.75 Support

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST	59	
25657	6	
47109	2	
47637	3	
<u>51775</u>	19	
53125	19	
53340	10	

m 10/02/16

D3428-1

Manufactured No

260 Each 5.0000 1.0000



8 Placard



B55565 10-2-17 SP

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST096	5	
50790	5	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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Comments: IPP Rev:A New Issue 07.09.12 EC verified by: JLM
IPP Rev:B ECN 1100 08-01-11 DD verified by: EC
IPP Rev:C Ecn 1121 08-02-25 DD Verified by:ec

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ AN6-35A	Replacement	Mfg/ Purchased	Bin	Primary No	Last	Route	Unit of Each	Qty on 72.0000	Remaining 4.0000	Qty	Date	Status
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BOLT

16-2-17 sf

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
------------------	----------------	-----------------

Location

Main Warehouse

ST

72

112314
112805
113422

22

20

30

4

AN6-36A



Bolt

Purchased No

260 Each 107.0000 4.0000

16-2-17 sf

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
------------------	----------------	-----------------

Location

Main Warehouse

ST

107

109632
110382
112314
113121

1

2

54

50

4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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Required Date: 1/28/2010

Comments: IPP Rev:A New Issue 07.09.12 EC verified by: JLM
IPP Rev:B ECN 1100 08-01-11 DD verified by: EC
IPP Rev:C Ecn 1121 08-02-25 DD Verified by:ec

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ MS21042L6	Replacement Purchased	Mfg/ Purchased	Bin No	Primary Last	Route 260	Unit of Each	Qty on 456.0000	Remaining 6.0000	Qty	Date 10-2-17	Status



Nut

<u>Warehouse</u> <u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-------------------------------------	----------------	-----------------

Main Warehouse

ST	456	
105077	22	
110002	5	
111548	8	
111578	400	
112492	21	

AN960JD616 Purchased No 260 Each 597.0000 18.0000



10-2-17

sf

AN960JD616



Washer

<u>Warehouse</u> <u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-------------------------------------	----------------	-----------------

Main Warehouse

ST	597	
112314	3	
112828	294	
113149	300	

10-2-17

sf

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD

Work Order: 55406

Description: Crosstube Low Fwd (205/212/412)

Part Number: D212-664-107

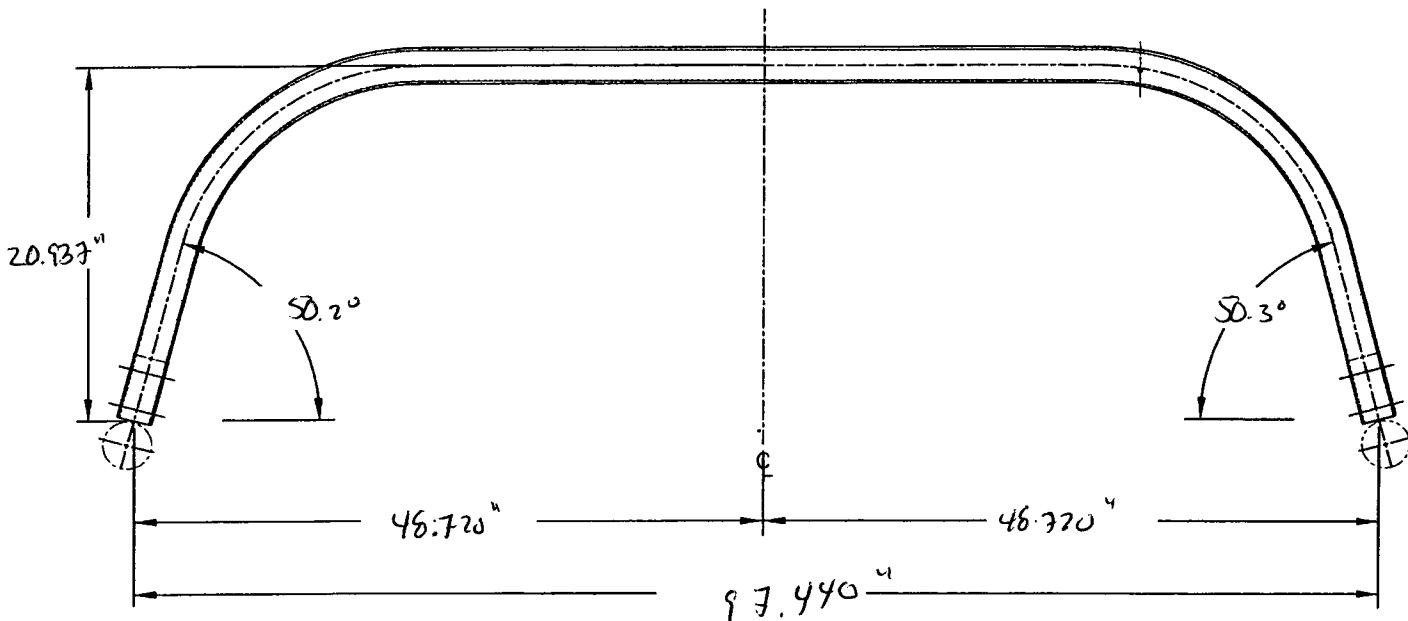
Inspection Dwg: D212-664-147

Rev: *ABG*

Page 1 of 1

10-01-21

Required Dimension	Min	Max
Height	20.79	21.05
1/2 Span	48.55	48.81
Angle	49	52
Total Span	97.1	97.62



Comments

QC15 Inspection

8

Date

10-01-21

Rev	Date	Change	Revised by	Approved
A	08.02.29	New Issue	KJ/JM	

8 7 6 5 4 3 2 1

B

Item	Qty -147	Qty -147B	Part Number	Description
1	X		D212-664-147	CROSSTUBE ASSEMBLY (205/212/412 LOW FWD)
2		X	D212-664-147B	CROSSTUBE ASSEMBLY (214 LOW FWD)
3	1	1	D6019-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	2	2	D3659-1	CUFF
7	4	4	MS21920-25	CLAMP (OR MS21920-26)
8	44	44	CR3212-4-06	RIVET (OR M78853-4-06)
9	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
10	A/R	A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

X55406

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6019-128
FINISHED LENGTH = 126.528±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUDD USING VIBRATING STYLUS.
- 7) WEIGHT: D212-664-147 = 24.2 lbs (PER IIN-D212-664)
D212-664-147B = 24.2 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUTHAS NOT BOTTOMED-OUT AFTER TORQUING.
- 16) INSTALL D3659-1 CUDD AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUDD AND CROSSTUBE. SEAL EDGE OF CUDD TO ENSURE NO GAPS.
- 17) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

RELEASED
2009-10-29

B	REVISE GENERAL NOTES/PART LIST; UPDATE TO CURRENT STANDARDS; ADD -147B (ZN C4-2, D4-2)	RF	09.09.30
A	NEW ISSUE	CP	07.07.07
REV.	DESCRIPTION		
DESIGN	99	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	99	DRAWING NO.	REV. B
MFG. APPR.	BB	D212-664-147	SHEET 1 OF 4
APPROVED	BB	TITLE	SCALE
DE APPR.	BB	CROSSTUBE (205/212/412 LOW FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PROPRIETARY AND CONFIDENTIAL AND IS SUPPLIED PURSUANT TO A AGREEMENT WHICH PROHIBITS IT FROM BEING COPIED OR DISCLOSED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1

D

C

B

A

A

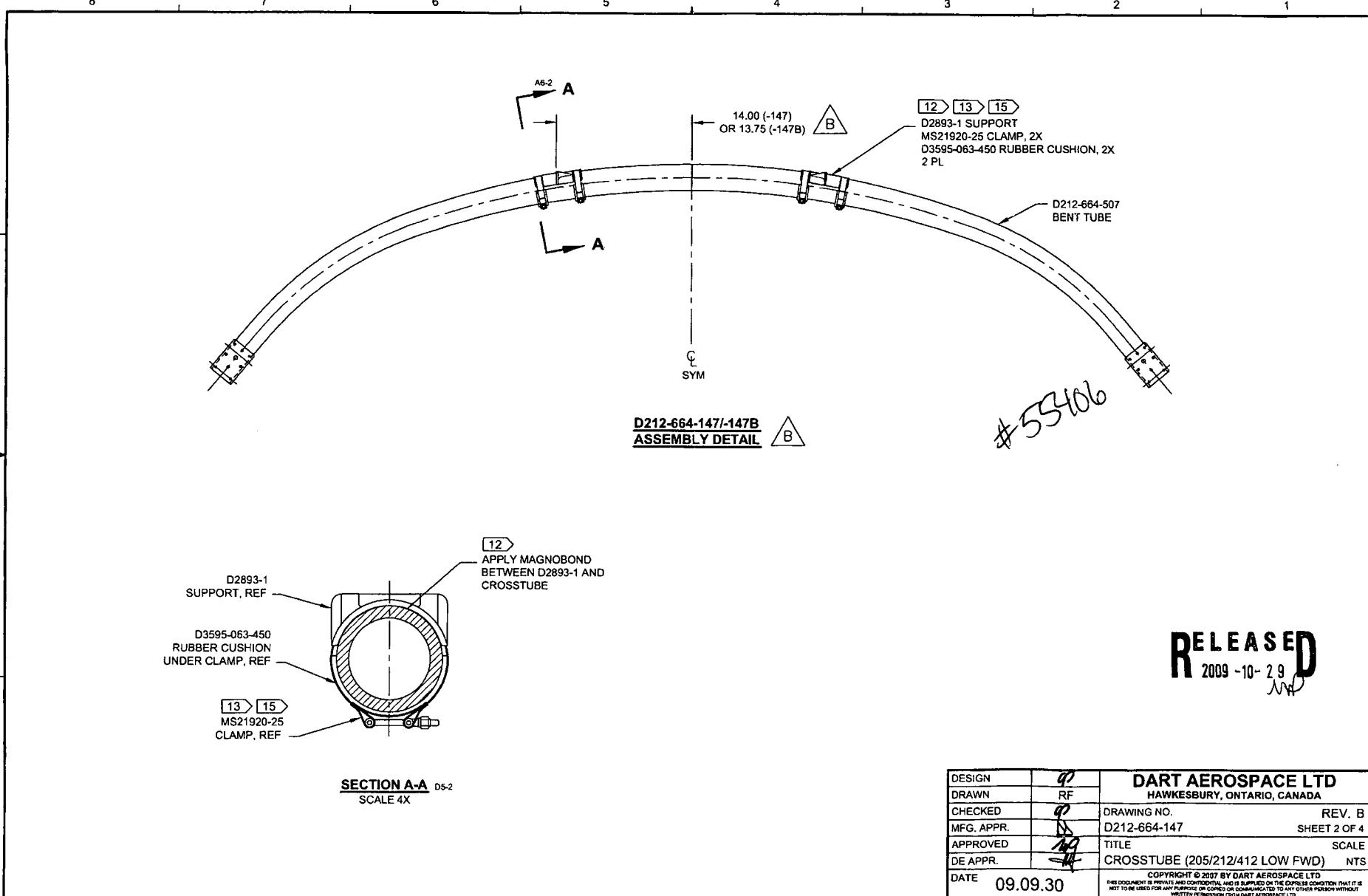
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

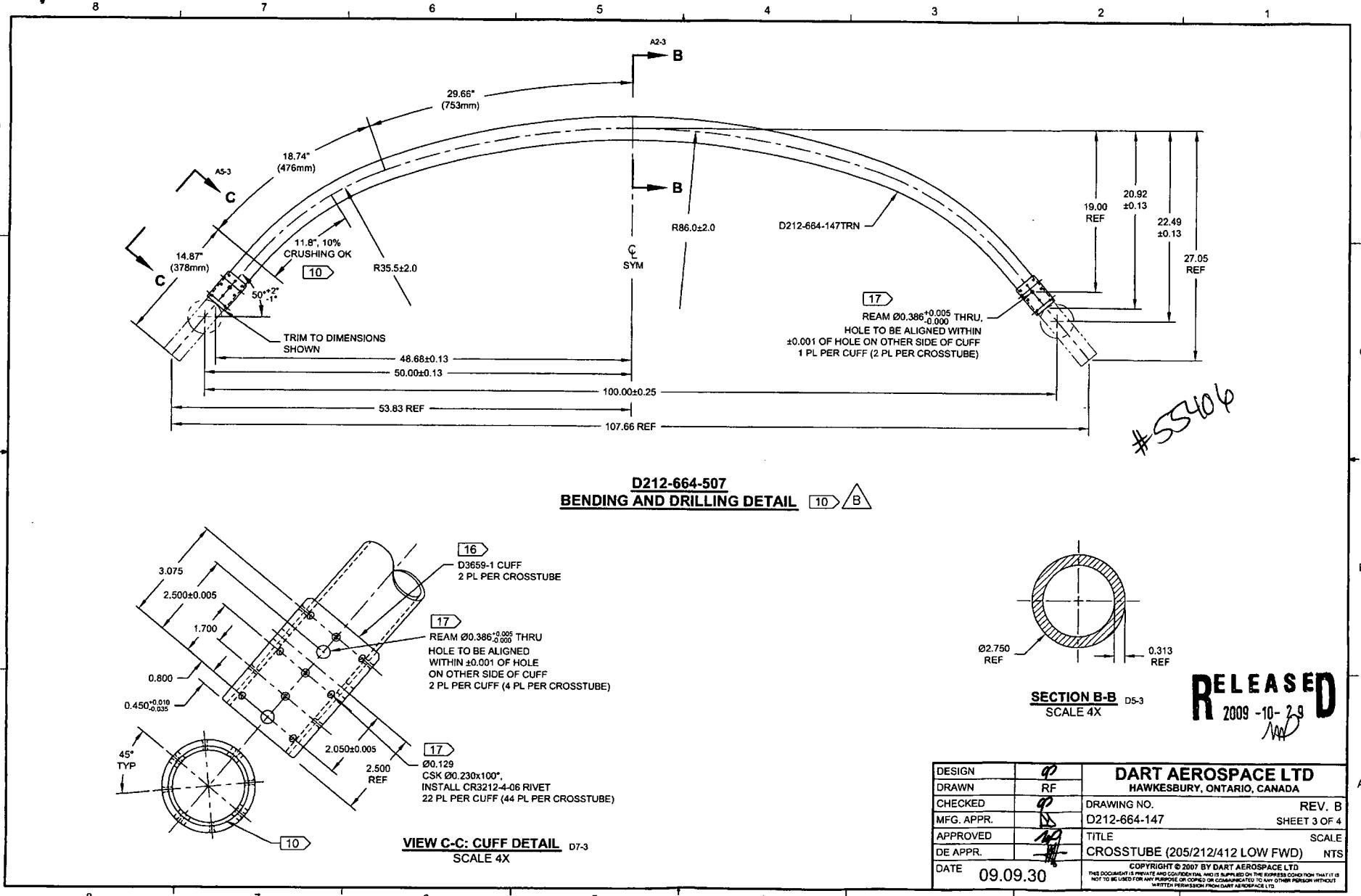


W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



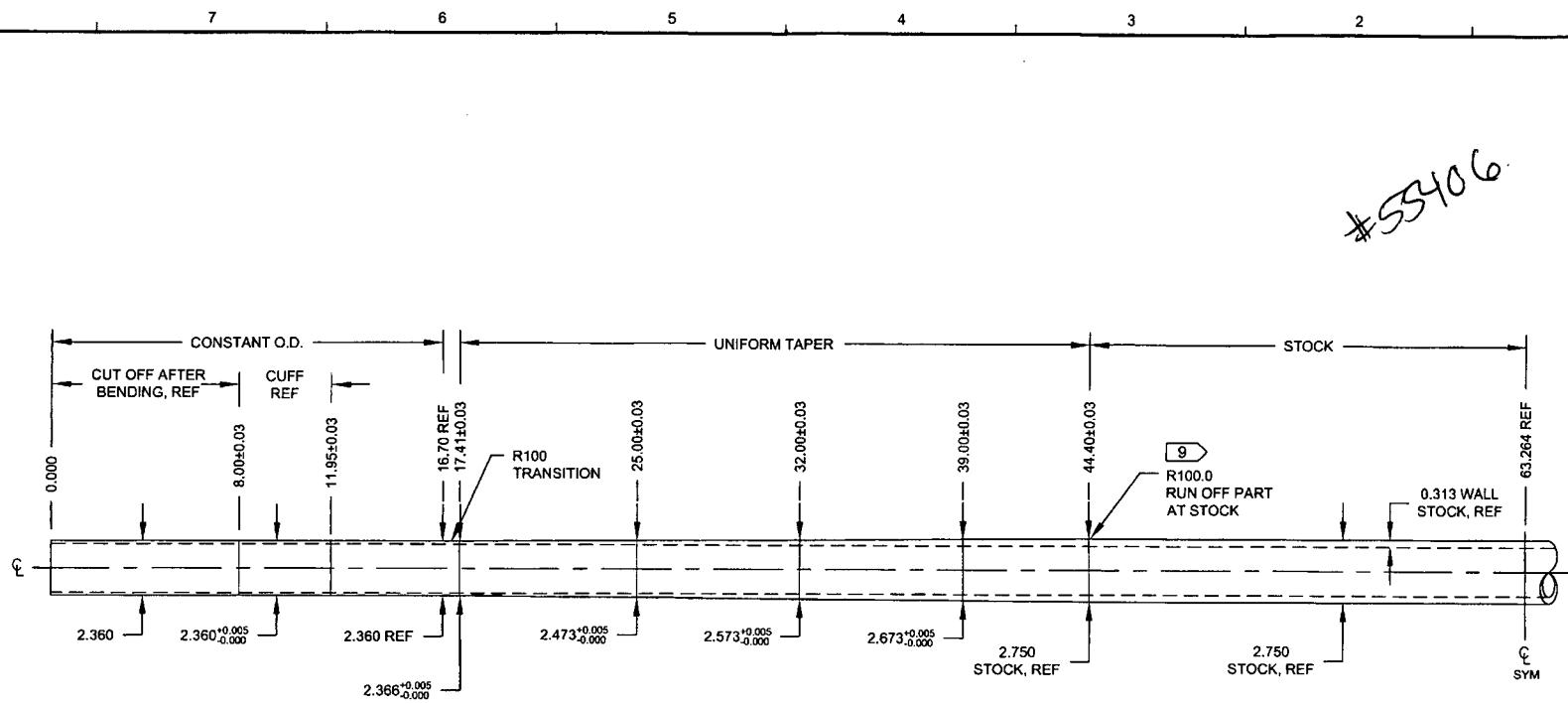
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



D212-664-147TRN
TURNING DETAIL

RELEASED
2009-10-29
[Handwritten signature]

DESIGN	<i>[Signature]</i>	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	<i>[Signature]</i>	DRAWING NO.
MFG. APPR.	<i>[Signature]</i>	D212-664-147
APPROVED	<i>[Signature]</i>	REV. B
DE APPR.	<i>[Signature]</i>	SHEET 4 OF 4
DATE	09.09.30	TITLE
		CROSSTUBE (205/212/412 LOW FWD) NTS

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

LIQUID PENETRANT TEST REPORT

P- 15316

CLIENT DAE Aerospace PAGE 1 OF 1
 ATTENTION LINDA TIME AM PM
 ADDRESS 1270 ABERDEEN ST. ACUREN JOB NO. 183-10-0650
HAWKESBURY ON. POMO NO. 11290
K0H 1K7 WORK LOCATION Hawkesbury -
 PROJECT ACCEPTANCE STD. ASTM 1417 REV./DATE 2007
 ITEM(S) EXAMINED (12) SLEEVE'S (6)

JOB DESCRIPTION PROCEDURE NO. LT6002 REV./DATE TECHNIQUE NO. LT-FAH 2 REV./DATE
 PART NO. STAINLESS STEEL MATERIAL ALUMINUM THICKNESS —
 SCOPE WET FLUORESCENT LIQUID PENETRANT INSPECTION CARRIED OUT 100% EXTERNAL

TEST DETAILS

METHOD <input checked="" type="checkbox"/> FLUORESCENT <input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH <input type="checkbox"/> SOLVENT REMOVABLE <input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND <u>MAGNAFLUX</u>	BLACK LIGHT S/N <u>16459</u> <input checked="" type="checkbox"/> OUTPUT > 1000 μ W/cm ² <input type="checkbox"/> AMBIENT < 2 fc
PENETRANT <u>ZL 67</u> MINIMUM DWELL TIME <u>45 10</u> MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER <u>H2O</u> MINIMUM DRY TIME <u>>10</u> MIN.	OTHER <u>LASER</u>
DEVELOPER <u>SKD 152</u> MINIMUM DWELL TIME <u>10</u> MIN.	LIGHT METER S/N <u>1078866</u> CAL DUE DATE <u>10/17/2010</u>
DEVELOPER TYPE <input checked="" type="checkbox"/> NON AQUEOUS <input type="checkbox"/> AQUEOUS <input type="checkbox"/> DRY	

TEST SURFACE

SURFACE CONDITION <input type="checkbox"/> AS GROUND <input type="checkbox"/> AS WELDED <input type="checkbox"/> MACHINED <input type="checkbox"/> SHOT BLASTED <input type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE <input type="checkbox"/> < -4°C/20°F <input type="checkbox"/> -4°C/20°F TO 10°C/50°F <input type="checkbox"/> 10°C/50°F TO 52°C/125°F <input type="checkbox"/> > 52°C/125°F
RESULTS- <input type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL

12 SLEEVE'S - W.O. 55638	✓
1 CROSS TUBE - W.O. 55132	✓
1 CROSS TUBE - W.O. 55133	✓
2 CROSS TUBE - W.O. 55406	✓
1 CROSS TUBE - W.O. 55404	✓
20 COLLECTIVE BELL CLAMP - W.O. 53635	✓
1 MOUNT - W.O. 55097	✓
1 CROSS TUBE - W.O. 55433	✓
1 CROSS TUBE - W.O. 55434	✓

ALL ITEMS EXAMINED ON THIS
 REPORT WERE FOUND ACCEPTABLE
 TO THIS STANDARD.

10 02 07

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE

Matthew Murdoch Matthew Murdoch
 PRINT SIGNATURE

DTR # E-27697

TECHNICIAN (SIGNATURE):

Mike Jenkins

REPORT
REVIEWED BY:

NAME (PRINT):

1ST TECHNICIAN MIKE JENKINS
 CGSB LEVEL II SNT LEVEL II
 CGSB REG. NO. 6606

2ND TECHNICIAN
 CGSB LEVEL _____ SNT LEVEL _____
 CGSB REG. NO. _____

NAME

INITIALS